

Upcoming Events



Data Reduction Workshop (<https://science.nrao.edu/facilities/evla/early-science/data-reduction-workshop>)

Sep 14 - 16, 2011 | Socorro, NM



ALMA Software Development Workshop (<https://science.nrao.edu/facilities/alma/naasc-workshops/almasoft2011>)

Oct 12 - 14, 2011 | Charlottesville, VA



Global Properties of HI in Galaxies (<http://www.gb.nrao.edu/tf35/tf35.shtml>)

Oct 17 - 19, 2011 | Green Bank, WV



NRAO Town Hall at the 219th AAS (<https://science.nrao.edu/science/aas/219/nrao-town-hall-at-the-219th-aas>)

Jan 10, 2012 | Austin, TX



ALMA Special Session at the 219th AAS (<https://science.nrao.edu/science/aas/219/alma-special-session-at-the-219th-aas>)

Jan 11, 2012 | Austin, TX



Outflows, Winds and Jets Workshop (<https://science.nrao.edu/facilities/alma/naasc-workshops/jets2012>)

Mar 3 - 6, 2012 | Charlottesville, VA

Approved NRAO Science Program: Semester 2011B

Tim Bastian and Joan Wrobel (Observatory Science Operations)

The Observatory has implemented a new proposal evaluation and time allocation process for the Expanded Very Large Array (EVLA), the Very Long Baseline Array (VLBA)/High Sensitivity Array (HSA), and the Green Bank Telescope (GBT). A total of 304 proposals was received at the 1 February 2011 submission deadline for Semester 2011B. Drawing from the community, eight Science Review Panels (SRPs) were constituted, each covering a science category. In aggregate, the SRP categories span the broad spectrum of modern research in astronomy and astrophysics.

The proposals underwent science review by the SRPs and technical review by NRAO staff. The results of these reviews were cross-reconciled by the Time Allocation Committee (TAC). The TAC consists of the chairs of the SRPs and is charged with recommending a science program for Semester 2011B to the NRAO Director. After approval of the science program, a disposition letter for each proposal was prepared and sent 31 May 2011 to all authors of the proposal.

The links below list the approved observing programs for Semester 2011B for the EVLA,

VLBA/HSA, and GBT that received a priority of A or B. Priority C programs are not listed because, as “filler” programs, their observing time is not assured. The following is provided for each approved program: PI name, proposal ID, proposal title, total hours allocated, and proposal type (Regular, Triggered or Large). For Large proposals or monitoring proposals the time allocated may be over more than one semester.

Expanded Very Large Array (EVLA)



To maximize EVLA Early Science, while simultaneously commissioning the hardware and introducing new capabilities, three separate observing routes were created: (1) Open Shared Risk Observing (OSRO), which provides first-light EVLA capabilities to the general user community; (2) Resident Shared Risk Observing (RSRO), which provides access to enhanced EVLA capabilities to those who are able to spend time in Socorro to help with commissioning; and (3) an EVLA Commissioning Staff Observing (ECSO) route giving commissioning staff access to the telescope to push new science capabilities.

The approved Semester 2011B EVLA observing programs are listed at <https://science.nrao.edu/science/science-program/programs2011b> (<https://science.nrao.edu/science/science-program/programs2011b>)

Very Long Baseline Array (VLBA) and High Sensitivity Array (HSA)



The newly approved programs for the VLBA and HSA make up only a part of the total science time available. Existing and new Large programs continue to dominate the scheduled observing over Regular programs.

The approved Semester 2011B VLBA/HSA observing programs are listed at <https://science.nrao.edu/science/science-program/programs2011b> (<https://science.nrao.edu/science/science-program/programs2011b#vlbalink>)

Green Bank Telescope (GBT)



A list of the approved Semester 2011B GBT observing programs is at <https://science.nrao.edu/science/science-program/programs2011b> (<https://science.nrao.edu/science/science-program/programs2011b#gbtlink>)

ALMA Construction & Early Science Proposal Review Process

Al Wootten



(images/16_antennas_AOS_DSC_0040.jpg)

Figure 1. Sixteen ALMA antennas are now at the observatory's high-elevation Array Operations Site (AOS) in northern Chile, the number of antennas specified for ALMA to begin science operations and an important project milestone. The 16th ALMA antenna, a European deliverable, recently joined antennas delivered by the North American and East Asian ALMA partners. Credit: ALMA (ESO/NAOJ/NRAO)

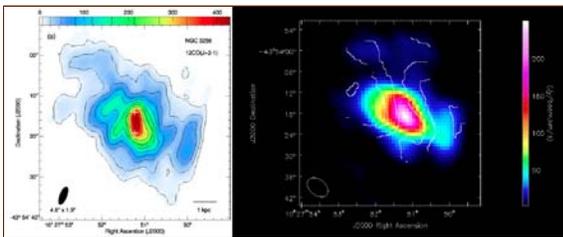


Zoom (images/16_antennas_AOS_DSC_0040.jpg)



(images/3a.png)

Figure 2. Exceptional Snowfall blanketed the Chilean Altiplano. ALMA is located to right of center on Llano Chajnantor. Photo: R. Hills. Credit: ALMA (ESO/NAOJ/NRAO)



(images/3b.png)

Figure 3. (Left) SMA CO (J=2-1) integrated intensity image of NGC3256. (Right) ALMA Science Verification data. The CO(1-0) "moment 0" total intensity image of NGC3256, with contours of the velocity field overlaid. Credit: ALMA (ESO/NAOJ/NRAO)



Zoom (images/3b.png)

In normal years, July may be counted on to produce the best submillimeter weather at Chajnantor. An

unusual combination of weather systems this winter, though, produced unusual amounts of snow in June and July. Altiplanic winds drop the snowfall in drifts on the downwind side of vertical barriers including the many ALMA elements now standing on the high plain. As a result, the arrival of the sixteenth antenna, a hallmark of readiness for Cycle 0 Early Science, was delayed a few weeks. Nonetheless, the science verification program continued, producing new data to be used to verify ALMA performance. Two science verification datasets were released in June, along with detailed guides to the reduction of the data.

One of these science verification datasets was an observation of the most luminous galaxy within ~ 40 Mpc of the Milky Way: NGC 3256. The luminosity of the galaxy results from the merger of two gas-rich galaxies, now in its later stages. In the central region of the galaxy, an extreme starburst powers emission across the spectrum, particularly in the far infrared and submillimeter regions. Two nuclei, oriented north-south, lie about 5" (850 pc) apart, and are accompanied by hundreds of bright young clusters. The southern nucleus is highly obscured, and molecular hydrogen emission peaks there (Pereira-Santaella 2010). Carbon monoxide emission was imaged in the J=2-1 line by Sakamoto et al. (2006) using the Submillimeter Array (SMA). A warm and turbulent disk of radius over 3 kpc rotates about a point between the nuclei, each of which hosts its own gas concentration. ALMA verification data were made in the J=1-0 line using the compact seven antenna array in place for commissioning in April 2011. Although the resolution of the verification image does not equal that of the SMA data, the distribution and velocity of the two CO lines is similar, particularly in the southwest and to the northeast. Note that CN lines were also included in the spectral windows available. The reader is invited to download and examine the data at <http://casaguides.nrao.edu/index.php?title=NGC3256Band3> (<http://casaguides.nrao.edu/index.php?title=NGC3256Band3>)

Note that a similar dataset and reduction guide for the protoplanetary disk source TW Hya at Band 7 (0.87 mm) is also available. The latter dataset has much finer channelization and requires about 100 GB of free disk space to exercise the data reduction.

At the end of July, sixteen ALMA 12m antennas are scheduled to be operating at the 16,500 foot elevation Array Operations Site (AOS). At this point, the array will be comprised of antennas from each of the contractors, all meeting the same specifications verified through the Assembly, Integration and Verification (AIV) process and fully outfitted for Cycle 0 Early Science. Work continues toward completion of the 16 km array

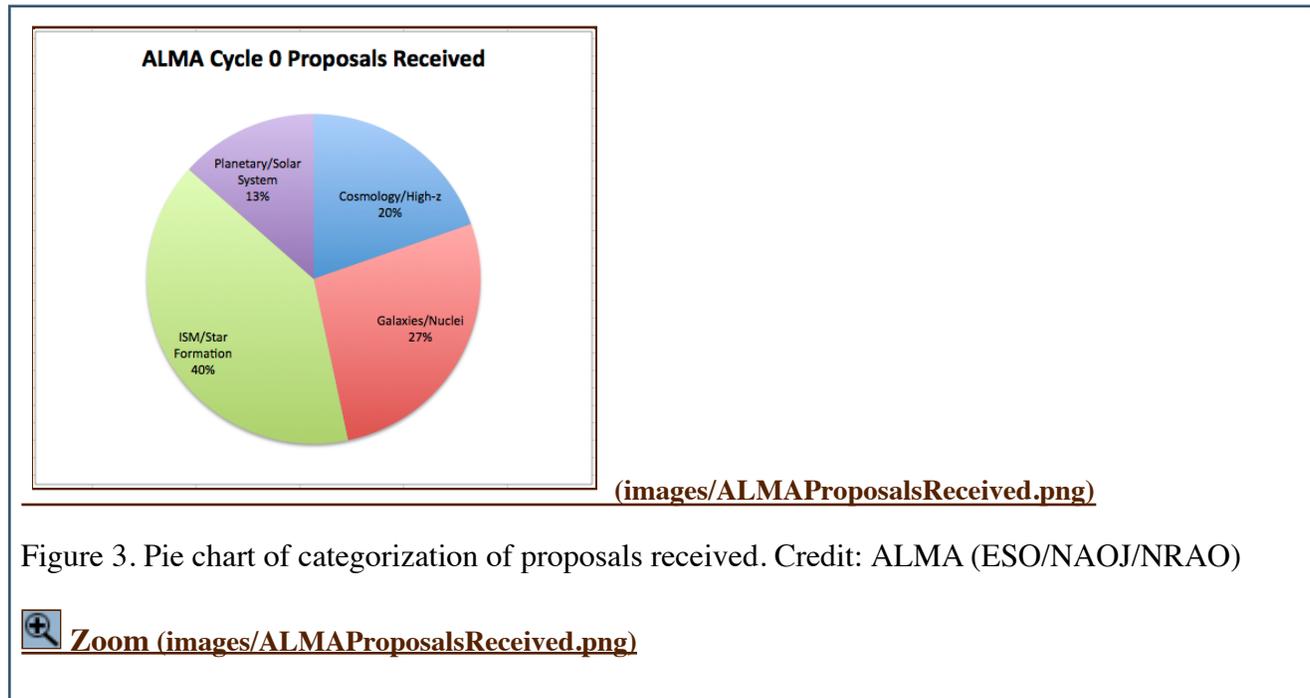
ALMA Cycle 0 Proposal Review Process

(From a **JAO News item** (<https://almascience.nrao.edu/news/alma-cycle-0-proposal-review-process-current-status-july-12>) posted to the ALMA Science Portal)

The astronomical community responded enthusiastically to the first ever ALMA Call for Proposals: 919 unique proposals were received by the 30 June 2011 deadline. Their distribution across the four ALMA science categories is as follows:

1. Cosmology and the high redshift universe: 20%;
2. Galaxies and galactic nuclei: 27%;
3. ISM, star formation/protoplanetary disks and their astrochemistry, exoplanets: 40%;
4. Stellar evolution, the Sun and the Solar System: 13%.

These proposals will be assessed by 8 ALMA Review Panels (ARP). Each ARP is composed of 6 Scientific Assessors (7 for Category 4) whose combined expertise covers the range of topics relevant to one of the four scientific categories. There are two ARPs for each of science categories 1 and 2, three for category 3, and one for category 4. The Chair and the Deputy Chair of each ARP will serve on the ALMA Proposal Review Committee (APRC). The APRC Chair does not belong to any ARP. Hence the total number of Science Assessors contributing to the Cycle 0 Proposal Review Process is 50.



The proposals were made available to the Scientific Assessors on 9 July. The review process consists of two stages. At Stage 1, each proposal is assigned to four members of the scientifically appropriate ARP, who must score it. The four individual scores are combined to compute a mean preliminary score. The scores and other input from the assessors will be used to identify the proposals that will proceed to Stage 2, discussion at face-to-face ARP meetings. Each ARP will discuss ~ 100 proposals.

Staff of the Joint ALMA Observatory and of the ALMA Regional Centers will carry out the technical assessments of all proposals to be discussed at Stage 2. The outcome of the technical assessment will be made available to the ARPs, for their reference.

The 50 science assessors will participate in face-to-face meetings of their ARP in Santiago, Chile 15-17 August to discuss the proposals.

All proposals will be assigned one of four letter grades A to D:

- Grade A: highest priority proposals.
- Grade B: high priority proposals, but scheduled at a lower priority than grade A proposals.
- Grade C: scientifically fruitful proposals that will be observed as filler projects if a higher grade proposal is not available for the current conditions.

- Grade D: proposals that will not be observed.

After the individual ARPs have met, the APRC members will meet face-to-face on 18-19 August to review the ARP results and determine the final assessments across the entire set of ALMA proposals and to prepare the final recommendations.

The Principal Investigator of each proposal will be informed of the assigned grade and will receive a “consensus report” summarizing the scientific assessment of the proposal and key findings relating to any technical problems that have been identified. We intend to send these notifications in early September.

This Month @ the NAASC

First Announcement: "Outflows, Winds and Jets: from Young Stars to Supermassive Black Holes" Science Workshop

The NRAO North American ALMA Science Center (NAASC) will host its 6th annual science workshop -- "Outflows, Winds and Jets: From Young Stars" to Supermassive Black Holes" -- in Charlottesville, Virginia, 3-6 March 2012. The venue is at the Omni hotel, located conveniently near downtown Charlottesville. Pre-registration is now open at the conference web site:

<https://science.nrao.edu/facilities/alma/naasc-workshops/jets2012> (<https://science.nrao.edu/facilities/alma/naasc-workshops/jets2012>)

2012 will be a special year for radio wavelength science. In addition to the much anticipated operation of ALMA Early Science, other upgraded NRAO facilities -- EVLA, GBT and VLBA -- are joining forces to offer the astronomy community unprecedented access to superb imaging capabilities, the highest angular resolution and sensitivity, broad spectral coverage, and the highest precision. These telescopes together will transform the science of jets and outflows from young stars to supermassive black holes. This workshop is an exciting opportunity to bring together active researchers interested in outflow-bearing systems of different mass and size scales for a refreshing view of these spectacular phenomena.

Key foci of the workshop will be:

- Deeply probing the driving engines with the upgraded facilities;
- Emission and absorption properties of outflows, winds, and jets;
- Structures and chemistry of the outflow systems at varying scales;
- Cross-talk among the participating communities; and
- Synergy programs with the featured facilities and other large telescopes.

The approach adopted by this workshop is interdisciplinary. Science arising across the mass and size scales will be naturally blended in. We hope to promote interactions among the various communities from young stars to active galactic nuclei, and to facilitate mutual exchanges and joint efforts at this special time.

ALMA Software Development Workshop

Mark Lacy

NRAO will hold a workshop 12-14 October 2011 to discuss software development plans for ALMA and closely related telescopes. The aim of the workshop is to come up with a set of ideas for software applications that will enhance the science output from ALMA and consortia willing to submit these ideas for ALMA development for seed funding via NRAO and, ultimately, full funding via the ALMA Board and/or the NSF. The workshop will concentrate on science data analysis of the large datasets that ALMA will produce. Topics will include line forest analysis, feature finding in large datacubes, matching data to simulations, visualization and compressive sensing.

The meeting webpage is at <http://science.nrao.edu/facilities/alma/naasc-workshops/almasoft2011> (<http://science.nrao.edu/facilities/alma/naasc-workshops/almasoft2011>).

Meet the NAASC



([images/2c.png](#))



[Zoom \(images/2c.png\)](#)

Stuartt Corder joined NRAO as a NAASC scientist on 1 October 2010. He earned his Ph.D. in 2008 from the California Institute of Technology under the direction of Anneila Sargent along with Melvyn Wright of the University of California, Berkeley. His focus then was on commissioning the Combined Array for Research in Millimeter-wave Astronomy (CARMA), particularly aspects of mosaicking and image fidelity. Between his Ph.D. and October 2010, he held positions as an ALMA postdoctoral researcher and a NRAO Jansky Fellow.

Stuartt is currently stationed in Santiago, Chile, where he lives with his wife, Jennifer, and three-year-old daughter, Vivian. His functional duties include working with the ALMA Commissioning and Science Verification team (CSV). Since July 2009, Stuartt has acted as lead of the CSV Data

Calibration Group. He also participates in a small group that defines and implements the observing scripts that drive ALMA observations. His current appointment is as CSV Liaison, mostly continuing his previous duties with CSV and supporting interaction between the NAASC and the Joint ALMA Observatory. His technical interests focus on interferometric mosaicking. His general scientific interests focus on star and planet formation in the local universe. Current, on-going research focuses on debris disks and kinematics in local star forming regions.

Stuartt will be relocating with his family to Charlottesville in April, 2012, after a three month stay in Socorro participating in RSRO with the EVLA. His NAASC duties will include user support with some continued effort in Chile.

Data Reduction Workshop

Gustaaf Van Moorsel

NRAO is organizing a Data Reduction Workshop that will be held 14 - 16 September 2011 at the Pete V. Domenici Science Operations Center in Socorro, NM. The aim of the workshop is to help participants cope with the new challenges posed by the increasing power and complexity of the EVLA. The focus will be on reducing data taken in the upcoming EVLA D-configuration (September 2011 - January 2012)

Local constraints require us to limit the total number of attendees to 40 persons. If the number of registrations exceeds 40, we will give precedence to those who have approved observing time in the next D-configuration. We will also have a waiting list in case space becomes available due to cancellations. The deadline for registration is Wednesday, 10 August at 15:00 MDT, and we will contact all registrants by August 12 as to whether they have been accepted for the workshop. Please do not make travel arrangements before then!

This is an advanced workshop, and unlike our Synthesis Imaging summer schools, is not intended for those who are new to radio interferometry. Prior experience with AIPS, CASA, or MIRIAD is required. We will be using CASA as our main data reduction package, but may use AIPS as well for some process steps, as needed. A working knowledge of CASA would be helpful.

To register please go to the Workshop's [website \(https://science.nrao.edu/facilities/evla/early-science/data-reduction-workshop\)](https://science.nrao.edu/facilities/evla/early-science/data-reduction-workshop) for further information and a preliminary program. We look forward to welcoming you to Socorro in September.

Global Properties of HI in Galaxies: A Green Bank Workshop

Jay Lockman, on behalf of the SOC

A Green Bank Workshop titled "Global Properties of HI in Galaxies" will be held 17-19 October 2011 at the NRAO in Green Bank, WV in honor of the 35th anniversary of the discovery of the Tully-Fisher relationship. This workshop will bring together researchers and students to discuss recent results on HI in galaxies. Topics will include:

- The Tully-Fisher Relationship and its application
- Structure of the nearby Universe revealed by HI Surveys of Galaxies

- The connection between global HI and galaxian properties
- The extended HI environment of galaxies

The intimate setting of the Green Bank Observatory fosters highly interactive meetings. Because of physical limitations, the workshop will have to be limited to about 50 participants. There will be no registration fee, and meals and local housing will be provided without charge. Weather permitting, Workshop participants will be treated to a tour to the top of the 100-meter diameter Green Bank Telescope.

Immediately following the Workshop, on 20 October, there will be information and training sessions on use of the GBT and EVLA, and an ALMA Training and Community Day.

A web site www.gb.nrao.edu/tf35 (<http://www.gb.nrao.edu/tf35>) will be available soon, or you can contact tf35@nrao.edu (<mailto:tf35@nrao.edu>) for further information.

Scientific Organizing Committee

- Helene Courtois, University of Lyon
- Rick Fisher, NRAO
- Martha Haynes, Cornell University
- Barbel Koribalski, CSIRO
- Glen Langston, NRAO
- Jay Lockman, NRAO
- Stacy McGaugh, University of Maryland
- Robert Minchin, NAIC Arecibo Observatory
- Karen O'Neil, NRAO
- D.J. Pisano, West Virginia University
- Brent Tully, University of Hawaii

The CASPER 2011 Workshop

Yashwant Gupta (NCRA), on behalf of the SOC



This year's Collaboration for Astronomy Signal Processing and Electronics Research (CASPER) workshop will be held at the National Centre for Radio Astrophysics (NCRA) in Pune, India, 10 - 14 October 2011.

Basic information about the meeting, including the first announcement and recent updates, is at the CASPER 2011 website, <http://www.ncra.tifr.res.in/casper2011> (<http://www.ncra.tifr.res.in/casper2011>)

In addition to talks and presentations on the latest designs, developments and instrumentation from the worldwide CASPER community, the program will include invited special talks from industry participants, as well as talks relating to the Square Kilometre Array requirements. Hands-on sessions and tutorials on CASPER designs, including test runs with simple designs at the Giant Metrewave Radio Telescope, are being planned to help newcomers to CASPER learn about the basic techniques. A preliminary list of tutorials is on the CASPER 2011 homepage.

Registration for the workshop is now open via the registration form on the CASPER 2011 homepage. The registration fees, along with the sponsorship support, will be used primarily to provide travel support to students from India and abroad, to attend CASPER 2011.

Three accommodation options are available: guest house accommodation at NCRA (reserved for students applying for financial assistance), guest house at nearby institutions, and regular hotels in Pune. Guest house accommodations are limited and will be allotted on a first-request basis for regular registered participants. Please register early if you would like guest house accommodation.

Some funds are available to support travel costs for students, with an upper limit of \$1000 for any one participant. Those interested in applying for this support should indicate their interest via the registration form, and also complete and submit the financial support request form. Those awarded travel grants will be expected to pay the registration fees.

We also encourage participants to fill out the abstract submission form as soon as practical to enable better organization of the scientific program.

The deadline for registration and abstract submission is 30 Aug 2011. The program of oral and poster presentations will also be finalized by 15 Sep 2011. Travel grant awards will be finalized and candidates will be informed by 15 Sep 2011. If you are not yet ready to register but are likely to participate, please fill out the expression of interest form, so that we can get a count of likely participants. Note that participation will be limited to the first ~ 100 registrations due to constraints of space at the venue.

For any further details about CASPER 2011, please feel free to contact us at casper2011@ncra.tifr.res.in (<mailto:casper2011@ncra.tifr.res.in>)

We gratefully acknowledge sponsorship support from NVIDIA, XILINX and MTE-India for CASPER 2011.

We look forward to seeing you in Pune this October.

6th NAIC/NRAO School on Single Dish Radio Astronomy

Karen O'Neil



From 10-16 July, more than 60 graduate and post-graduate students, as well as many NRAO Research Experiences for Undergraduates (REU) summer students, gathered at NRAO's Green Bank, West Virginia site to learn about the intricacies of single dish radio astronomy. The students enjoyed lectures ranging from the basic science conducted with

 the Arecibo and Green Bank single dish radio telescopes through detailed descriptions of the radiometer equations, calibrating sources at centimeter and millimeter wavelengths, how weather can affect observations, and detailed hardware designs.

The school also included an update on the Large Millimeter Telescope in Mexico, a talk and demonstration of the Common Astronomy Software Applications (CASA) processing package, and a description of ALMA's total power mode. In addition to lectures, the students had the opportunity to use NRAO's 40-foot educational telescope as well as the GBT and Arecibo for science observations.

The school concluded with student presentations of their science results followed by an excellent talk by Mark Devlin (Univ Penn) on bolometer observations at the South Pole and in Green Bank.

All in all an excellent time was had by both students and lecturers.

Career Opportunities

New Postings

ALMA Program Manager: (<https://careers.nrao.edu/applicants/Central?quickFind=50665>) The Joint ALMA Observatory (JAO) located in Santiago, Chile is recruiting for a Program Manager to provide leadership and management to the Program Management Group. The Program Manager will be responsible for the day-to-day management of observation execution, tracking of the status of ALMA programs as well as data quality control and coordination of these activities with the three ALMA Regional Centers (ARCs) located in Europe, North America and East Asia.

Scientific Programmer: (<https://careers.nrao.edu/applicants/Central?quickFind=50664>) The National Radio Astronomy Observatory in Charlottesville, VA is seeking a Scientific Programmer who will research and develop software to visualize and analyze ALMA data. The developer must become familiar with Common Astronomy Software Applications (CASA) code and practices, work within the existing CASA framework to improve and develop C++ code using the Qt platform, and extend the DBUS interface to enable interactive use of existing analysis tools within the CASA system.

Data Base Administrator: (<https://careers.nrao.edu/applicants/Central?quickFind=50654>) The National Radio Astronomy Observatory in Socorro, NM is accepting applications for a Data Base Administrator to work within the NRAO-NM software development and computing groups and maintains and develops both database infrastructure and applications across several telescopes and projects.

Project Scientist: (<https://careers.nrao.edu/applicants/Central?quickFind=50650>) The National Radio Astronomy Observatory in Green Bank, WV is recruiting for a Project Scientist. The successful candidate will provide scientific guidance to the project manager and project team; lead

the testing and commissioning of the receivers on the 20 Meter Telescope; lead the development of a time allocation framework that enables scientific and educational users; and advise UNC scientists and programmers who are developing the user interface and data reduction tools as well as supervise early science with the 20 Meter.

Division Head: (<https://careers.nrao.edu/applicants/Central?quickFind=50655>) The National Radio Astronomy Observatory in Green Bank, WV is seeking an enthusiastic and energetic person to head the Software Development Division. The Software Development Division head is responsible for managing the division as well as working with the other division heads in Green Bank to plan the future of the telescope and optimize its scientific use.

Procurement & Contracts Manager: (<https://careers.nrao.edu/applicants/Central?quickFind=50662>) The National Radio Astronomy Observatory in Charlottesville, VA is seeking a Procurement and Contracts Manager. The incumbent will be responsible for the management and operation of the Observatory contracting and purchasing functions as well as for the development and implementation of Observatory-wide procurement policies and procedures.

From the Archives

Ellen Bouton



([images/archive.png](#))

About this month's photograph: Sgt. Porcas' Lonely Post-Doc Band. The 1976 Charlottesville post-docs gather in a send-up of the classic, solemn Solvay Conference photos of Einstein, Rutherford, M. Curie, etc. [Left to right]: Phil Hardee, Steve Spangler, Russell Hulse (standing), Lee J Rickard, John Armstrong (standing), Jesse Hill, Richard Porcas. John Armstrong believes Tom Jones took the photo. Richard Porcas says, "Note the blackboard filled with equations for the occasion. We could not get either Einstein or Rutherford

to join us." Thanks to Richard Porcas, John Armstrong, and Russell Hulse for help in tracking down the photo and for commentary.

From the Archives is an ongoing series illustrating NRAO and U.S. radio astronomy history via images selected from our collections of individuals' and institutional papers. If readers have images they believe would be of interest to the Archives, please contact Ellen Bouton, ebouton@nrao.edu (<mailto:ebouton@nrao.edu>).

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